Geometry

Outdoor Activity- Proportions

Goal: I (the student) will find the height of objects by setting up proportions in similar triangles with their own height and shadow to determine the height of the object.

Relevance: You can use proportions and similar triangles to find the height of objects that are not easily measureable in everyday life.

Warm-up: The Empire State building is 1,250 ft tall. You are 6 feet tall and have a shadow of 8 ft. Determine the length of the shadow of the Empire State Building if the shadows and height are proportional.

Determining Heights of objects

Plan Stage:

1. What information will need to be collected in order to find the height of an object that is not easily measureable?

My height, my shadow length, and the length of the shadow of the object.

1. How will we use this information to solve for the height?

Set up a proportion to solve for the height

1. What will the proportion look like?
2. How will I find the height of the object once I set up the proportion?

Use the cross multiply method to solve for the unknown height.

Data Collection Stage

Object 1

My Height: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

My Shadow Length: \_\_\_\_\_\_\_\_\_\_\_\_\_

Name of Object 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Object Shadow Length: \_\_\_\_\_\_\_\_\_\_\_

Object 2

My Height: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

My Shadow Length: \_\_\_\_\_\_\_\_\_\_\_\_\_

Name of Object 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Object Shadow Length: \_\_\_\_\_\_\_\_\_\_\_

Calculation Stage

Object 1

Objects Height:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Object 2

Objects Height: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reasonableness Stage

Does your answer for the height make sense? Justify why it does make sense and if it doesn’t, what are some possible reasons for the errors?

Object 1 Reasonableness

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